are, *e.g.* H_2O 17·1 (instead of 18), CO_2 42·9 (44), S 36 and 37·7 (32), so that the sulphur would appear to be monatomic at that high temperature.

E. Wedekind (Tübingen) produces colloid zirconium by reducing the oxide with magnesium and extracting with hydrochloric acid; O. Burns (Boston) colloids of paper, oxides, sulphides, &c., by shaking them for many hours. Monti (Turin) spoke on the concentration of solutions, perfumes, wines, and ordinary salts by freezing; the acids and salts collect in the microscopical interstices between the small ice crystals, and when frozen blocks are left to themselves, the substances diffuse downward; concentration by cold is more economical than by heat. Bredig (Heidelberg) and Count Schwerin (Höchst) spoke on electric osmosis, E. Solvay (Brussels) on a gravitation formula applicable to diffusion phenomena, Zengelis (Athens) on the production of very high temperatures by burning aluminium in oxygen and other gases. The kinetics of the catalytic sulphuric acid process were discussed by Knietsch (who has worked the process out in Ludwigshafen) in section ii., and by Bodenstein and Bodländer in x. Similar papers were read by Schenck (Marburg) on the splitting of CO, by H. Goldschmidt (Christiania) on the kinetics of reductions, by Bodländer on technical catalysis. H. Goldschmidt (Essen) reported on the manufacture of steel in the electric furnaces of Stassano, Gin-Leleux, Héroult, Keller, Kjellin, and others; Bancroft and A. A. Noyes on electrochemical research in the United States; Fr. Foerster (Dresden) and Brandeis (Aussig) on electrolytic preparation of inorganic compounds; M. Le Blanc (Karlsruhe) spoke on electrolysis with alternating currents and the possibility of determining the velocity of ionic reactions; Coehn (Göttingen) on electrode influence in electrolytic oxidations and reductions, H. Moissan on metallic carbides, Héroult on the efficiency of electrolytic soda processes, Danneel and Nissenson on the electrolytic deposition of metals, Küster (Clausthal) on dissociation pressure of soda solutions, W. Marckwald on his radioactive tellurium, and Precht (Hanover) on the spectrum and atomic weight of radium (in ix.). W. von Bolton demonstrated what he briefly calls luminosity of the ions. When a carbon rod is lowered as anode into sulphuric acid, containing a copper spiral as kathode, the rough surface of the carbon becomes at once bright under the influence of currents of 110 volts. When rods of metals (or of carbon) are dipped into solutions of their salts, the rod being the kathode, a platinum spiral the anode, the rod begins to glow in brilliant colours, and beautiful band spectra of the ions (?) are obtained, differing from the spark spectra which result when the anode is glowing. The discussions were very good. H. Borns.

SOUTH-EASTERN UNION OF SCIENTIFIC SOCIETIES.

The eighth annual congress of the South-Eastern Union of Scientific Societies was held at Dover on June 11–13. A lively address by the president, Sir Henry Howorth, F.R.S., put pin pricks into all the infallibilities, begging the student to accept no predominant hypothesis without demur, to resist the fascination of great names, to challenge the exactness even of the exact sciences. Fallacies might often lurk in phrases, as when "the survival of the fittest" was glibly used to mean nothing more than the survival of the survivors. The address impressed its hearers with the advantage which every branch of science might derive from the touch of a keen and active critical faculty, working outside the ranks of the specialists.

The papers contributed to the congress fall into three classes, the purely local, the general, and those of divided interest. In the last of these Mr. A. T. Walmisley's essay discussed the methods by which a traveller between Kent and the Pas de Calais might cross the intervening strip of shallow water, on, in, under, or over it, without the incidents which now so often befall him when the "silver streak" is converted into a tumultuous concourse of atoms. The new turbine steamer was indicated as the best chance for humanity—at least until something better is invented. Mr. W. Whitaker, F.R.S., observed that clearly nature had expressly designed the Straits of Dover for a submarine tunnel, though politicians might think otherwise. Mr. A. O. Walker, dealing with the effects of climate on distribution, compared his long experience of the fauna and flora of Cheshire and North Wales with his later observations while residing near Maidstone.

Of local papers the most important was that by Mr. Sydney Webb and Captain McDakin on the disappearing fauna and flora of the district. There were many lamentable and in part unavoidable losses. The dwindling of the colony of seals at Beachy Head was deplored, but no tears were seen to fall at the news that vipers were becoming scarce and polecats scarcer. The congress museum was instructively adorned by Mr. Webb's fine collection of Lepidoptera with their caterpillars, and by the display of plants with their seedlings from the Catford Society.

Prof. Boulger opened a discussion on the best means of checking the extermination of British plants and animals. Dr. Rowe, in a paper on the importance of zonal distribution, alluded to the doctrine that the souls of good geologists go hereafter to their favourite "sections," and hoped he might be allowed to stake out his claim to a particular slice of Dover Chalk, from which he had already abstracted about 5000 fossils.

The non-local discourses included an interesting account by the Rev. R. A. Bullen of "a late Celtic cemetery at Harlyn Bay," and a valuable investigation by Miss Ethel Sargent, who unfolded the story of Geophilous plants, explaining how these "lovers of the soil," to suit seasons and climates, for periods of varying duration, keep themselves close within the protecting bosom of their mother earth, the seeds and bulbs in the meantime, with a kind of vegetable instinct, ever using their foodstore to the best advantage. The concluding address was by Dr. Jonathan Hutchinson, F.R.S., the retiring president, who at two successive congresses has delighted his audience by a finely-argued discussion of a subject not at the first blush very attractive. His theme was leprosy. His theory is now well known, that this disease is caused by the consumption of badly cured fish, or occasionally by the eating of food which has been handled by lepers. During the last two years he has visited Africa and India, everywhere seeking out lepers and leprous communities, especially in places where he had been told that a fish diet was out of the question. Everywhere he found that in that particular his informants had been misinformed. A quotation from Erasmus sent to Dr. Hutchinson by a classical friend represented the Pope himself as proposing to proscribe the use of salt fish on account of its supposed tendency to spread leprosy, though it is not salt fish in itself that lies under any evil imputation. Erasmus often makes ironical statements, but on the foul effects produced in his day by the consumption of putrid fish his dialogue "Ichthyophagia" speaks with no ambiguity.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

Oxford.—The following is the text of the speeches delivered by Prof. Love in presenting M. Poincaré and Prof. Story-Maskelyne for the honorary degree of D.Sc. at the Encænia on June 24:—

Nescio an maximus inter mathematicos qui nunc vivunt sit Henricus Poincaré: vir iure mirandus non solum quod novis viis quærendi usus novos fructus adeptus est, sed quod tot et tam diversa doctrinæ genera unus complecti potuit, cum commentariis innumerabilibus fere omnes geometrices et analyseos partes illustraret. Cum in hæc recondita doctrinæ arcana altius penetrasset, rite eum Regalis Societas ornavit numismate aureo in memoriam Professoris nostri Sylvester instituto quod ei primo datum est. Non solum subtilissimis illis quæstionibus quæ de mathematicæ veritatis natura inter philosophos oriuntur hunc auctorem plerique sequuntur, sed ingenii maximi viribus nisus de luce, de vi electrica, de difficillimo quoque doctrinæ genere præclarissime disseruit. In Astronomia certe ea de motu et de figura planetarum est commentatus ut omnibus de hac re quærentibus nova quadam et meliore via insistendum sit. Hunc talem virum in omni genere doctrinæ insignissimum, rerum naturam animo peragrantem, geometren, physicum, astronomum præstantissimum, Academia nostra inter suos doctores libentissime adscribit.

Septem et quadraginta abhinc annos Willelmo Buckland successit Mervin Herbertus Nevil Story-Maskelyne, Minera-

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logiæ primo Prælector mox Professor factus, quem honorem, nulli antea apud nos concessum, novem et triginta annos nullo intervallo retinuit, nec nisi octo abhinc annos deposuit. Primus etiam eodem fere tempore minerarum in Musæo Britannico custos creatus trium et viginti annorum labore effecit ut maxima vis minerarum omnium, nusquam alias in omni orbe terræ invenienda, intra parietes Musæi Britannici congereretur. Quod ad scientiam exquisitiorem pertinet, natura lapidum de cælo iactorum investiganda summam laudem adeptus est: idem minerarum et crystallorum formas et species accuratissime descripsit. Sed magistri boni præcipua laus in discipulis constat, neque silendum arbitror multos ex iis, qui hodie in hac scientia principes et signiferi sunt, hoc auctore et Professore doctissimo usos esse. Idem rude iam donatus a Musæo Britannico ita recessit ut rei publicæ se daret et Crickladensium suffragiis ornatus in publico totius civitatis consilio indivisi imperii vindex et defensor acerrimus sederet. Addo quod Regalis Societatis Sodalis et Collegii Wadhamensis socius honoris causa creatus cum multis virorum doctorum societatibus et in Europa et in America litterarum commercio coniunctus est.

PROF. J. LARMOR, F.R.S., has had the honorary degree of doctor of science conferred upon him by the University of Dublin.

A COMMITTEE has been formed with the object of raising a memorial in honour of the late Mr. T. G. Rooper, who died on May 20. Mr. Rooper held the office of H.M. Inspector of Schools in the Isle of Wight, Southampton and the neighbourhood during the last seven years, and both in his district and elsewhere he promoted the development of rational teaching of geography, natural history and other science studies. Information concerning the proposed memorial will be gladly supplied by Profs. F. J. C. Hearnshaw and J. F. Hudson, Hartley University College, Southampton.

THE appeal for funds for extending and modernising the scientific departments of the University of Dublin, to which reference was made last week (p. 188), should receive liberal support not only from graduates of the university, but also from all who sympathise with the cause of higher education in Ireland. Each science department of the university is in need of funds for laboratories, instruments, and other means of study and research. The university has already made considerable outlay in order to increase the efficiency of the scientific departments, but the new demands created by modern developments are too many and extensive to be met by existing resources, and it is necessary to ask for additional endowments if the university is to maintain its high position among the educational forces of the British Isles. In making the appeal for funds, it is pointed out that the important position assumed by modern science as a subject of collegiate education, and the great expansion of the scientific professions, render it incumbent on the older universities to make a costly provision for the adequate teaching of the experimental sciences. Not only must the universities of to-day be able to extend to their students—whether professional or in arts—sound theoretical and practical instruction in the established principles of science, but if these corporations are to continue to fulfil their duties efficiently, they must, in addition, provide facilities for research available both to student and teacher. In short, the demands on the resources of universities are not only for the endowment of chairs of science and the salaries of assistants and demonstrators, but also for the provision, equipment, and maintenance of lecture-rooms for teaching, and laboratories for both class-work and research. Moreover, the provision for laboratory equipment must be adequate to meet the ever-fresh demands of scientific advance. In the past the University of Dublin has discharged her duties towards the newer studies in a manner which has, in many particulars, set example to wealthier bodies. But a time has arrived when expenses must be incurred beyond her existing resources, and the University of Dublin must either obtain external aid to build and equip laboratories and lecture-rooms for physical science, electrical and mechanical engineering, botany and zoology, or conduct under grave disadvantages the instruction of those students who require to include these subjects in their professional training, or in their courses in arts.

A REPORT drawn up by a committee appointed by the Board of Trinity College, to consider the present scientific requirements of the college, shows that a sum of at least 100,000*l.* is needed by the scientific schools of the university. The appeal from which this statement of position and needs of the university has been taken is signed by Lord Rosse (Chancellor of the university), Mr. D. H. Madden (Vice-Chancellor of the university), Prof. Geo. Salmon (Provost of Trinity College), Lord Ashbourne, Lord Lansdowne, Lord Pembroke, Lord Ardilaun, Lord Iveagh, Lord Rathmore, Mr. E. H. Carson, Mr. W. E. H. Lecky, and Mr. J. H. M. Campbell. To carry the recommendations of the committee into effect, a considerable expenditure (for which no provision can be made out of college funds) must be incurred, including a capital outlay (for building and fitting laboratories and the like purposes) of 34,000*l.*, in addition to an annual charge for increased salaries and other expenses, estimated at 2730*l.* per annum. Lord Iveagh has generously offered to provide the capital sum of 34,000*l.* so soon as a sufficient amount has been collected and invested to produce the annual outlay contemplated by the committee (viz. 2730*l.* per annum), and this offer will hold good for three years from May 1 next; or if a sufficient annual income is assured by investments for carrying out the recommendations of the committee for any one department, he is prepared to contribute the capital expenditure necessary for the equipment of that particular department. A very large sum has to be collected during the next three years, but Lord Iveagh's offer ought to inspire others to contribute as generously as they are able to the subscription list. The Chancellor of the university, Mr. Benjamin Williamson, and Prof. W. E. Thrift are acting as honorary treasurers of the science fund.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, May 14.—"On the Radiation of Helium and Mercury in a Magnetic Field." By Prof. Andrew **Gray**, F.R.S., and Walter **Stewart**, D.Sc., with Robert A. **Houstoun**, M.A., and D. B. **McQuistan**, M.A., Research Students in the University of Glasgow.

The experiments had for their object primarily to test for lines of different substances, the proportionality of the change $d\lambda$ of wave-length, for each of the components into which a single spectral line is resolved by the application of a magnetic field, to the field intensity H, and to deduce the corresponding values of the ratio e/m of charge to mass of the electron. The apparatus consisted of a set composed of a large electromagnet (built to Prof. Gray's specification), and an echelon spectroscope of twenty-six plates with auxiliary (by Hilger, London). The readings were obtained by means of a micrometer eye-piece fitted to the observing telescope. The first observations were made at right angles to the magnetic field on several of the helium lines, and on the green line of mercury. The results were used to calculate the values of $d\lambda/\mathrm{H}\lambda^2$, and of e/m by the formula $e/m = 2\pi v.d\lambda/\mathrm{H}\lambda^2$, where v is the velocity of light, 3×10^{10} cm. per second. In every case the normal triplet was obtained, and the separation between the extreme components found to be proportional to H up to fields of 10,000 C.G.S.; at fields above this the light becomes so faint, in all the tubes with which the authors worked, that it is impossible to obtain readings. The following table shows the results:—

Substance.	Wave-length, 10^{-8} cm.	$d\lambda/\mathrm{H}$.	$d\lambda/\mathrm{H}\lambda^2$.	e/m.
Helium ...	5016 (green)	$1{\cdot}61\times10^{-5}$	$6{\cdot}41\times10^{-5}$	$12{\cdot}1\times10^6$
,,	5876 (yellow)	$2{\cdot}07\times10^{-5}$	$6{\cdot}00\times10^{-5}$	$11{\cdot}3\times10^6$
,,	6678 (red)	$2{\cdot}90\times10^{-5}$	$6{\cdot}49\times10^{-5}$	$12{\cdot}2\times10^6$
Mercury...	5461 (green)	$2{\cdot}12\times10^{-5}$	$7{\cdot}12\times10^{-5}$	$13{\cdot}4\times10^6$

At a field intensity of 13,000 C.G.S. the centre component of the normal triplet was doubled, while each of the outer components was itself tripled. The polarisation of the two triplets and of the central doublet was the same

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